Immediate PhD Student Position
Mobility-as-a-Service (MaaS) modelling and management

Joint PhD - KU Leuven (Belgium) and Tel Aviv University (Israel)

KU Leuven

KU Leuven is a top-50 global research university with 600 years of academic excellence. Our vibrant and diverse community includes scholars from over 150 nationalities. Located in Leuven, where students make up half the population, the university offers an exceptional academic environment. Since 2016, Reuters has consistently ranked KU Leuven as Europe's most innovative university.

Centre for Industrial Management / Traffic and Infrastructure (CIB) at KU Leuven

The research at CIB focuses on several topics of advanced modelling, optimisation, and management of transportation and logistics systems. Our research strengths include operations research, logistics management, transportation planning, network design, intelligent transportation systems, and traffic control. As a founding member of the KU Leuven Institute for Mobility (LIM), CIB contributes to an interdisciplinary research network that addresses technological innovations, societal trends, and evolving mobility needs through collaborative, cross-disciplinary approaches.

Tel Aviv University

Tel Aviv University (TAU) is the largest, most comprehensive, and most dynamic research and teaching institution in Israel, offering the country's most diversified range of study and research fields, with nine faculties and over 30,000 students, 1,200 researchers and 125 schools and departments across the sciences, humanities, and arts. Located at the heart of Israel's economic, technological, and cultural center, TAU is proud of its liberal and pluralistic spirit. TAU ranks first in Israel (Times & Taiwan rankings); as a global top 100 innovation university (Reuters); and seventh in the world – and first outside the USA – for producing successful, VC-backed entrepreneurs (PitchBook). The University's cutting-edge advancements are reinforced through ties with prominent research institutions ranging from NASA and Harvard to Tsinghua University and CERN.

Future Mobility Lab at Tel Aviv University

Future Mobility Lab is a cutting-edge lab in the field of Smart Mobility. In the lab we investigate the potential and impacts of innovations and New Mobility forms on transportation systems and urban environment with an explicit focus on large-scale complex systems, transport-environmental policies, future/automated mobility solutions, and equity. For this purpose, we develop and use state-of-the-art methodologies in behavioral models, simulation, data collection, and analytical tools. For more information see: https://futuremobilitylab.sites.tau.ac.il/

Project Overview

Mobility-as-a-Service (MaaS) represents an innovative approach to transportation, integrating multiple mobility options through a single digital platform to meet user travel needs. Despite growing interest, significant knowledge gaps exist regarding how MaaS will interact with existing transportation systems and how to optimise these complex service networks. Representative field trials can feasibly only be conducted on small scales, and the variety of concepts makes predicting the impact on large transportation systems strenuous, highlighting the need for advanced modelling and simulation approaches.

This research aims to address these challenges through three primary objectives: a) develop a comprehensive MaaS modelling framework that captures the complex dynamics between demand and supply, with a particular focus on multi-layer optimisation and management strategies; b) implement this framework within a novel large-scale agent-based simulation platform; c) conduct a small-scale real-world demonstration to assess MaaS solutions, evaluating market penetration, impacts on travel behaviour, transportation network performance, and service provider operations.

Responsibilities

The specific responsibilities will involve:

- Contribute to the development and implementation of behavioural and optimisation models (e.g., demand generation, tour creation, fleet optimization).
- Solve abstract complex problems/ideas and convert them into useable algorithms/software modules.
- Work with other research scientists to turn transport models into working code, involving the design, implementation, and testing of the models and code.
- Data preparation and analysis
- Work with researchers on publishing research papers
- Participate in scientific dissemination activities, such as scientific conferences, workshops, etc.

Requirements

- Masters in Transportation, Applied Mathematics, Operations Research, Computer Science, or related field
- General knowledge of Transportation Systems
- Programming skills
- Data analysis and data preparation skills
- Quantitative methods used in exact science, such as Statistics and Modelling
- Independent and self-motivated, yet able to work as part of a multidisciplinary team
- Demonstrated ability to effectively manage concurrent technical tasks with competing priorities
- Proficient verbal and written communication skills in English
- Willingness to learn

Preferential advantages:

- Knowledge of Python and SQL
- Relevant experience in the transport engineering field
- Experience using transport simulation software
- Able to work with GIS programs, especially QGIS

Duration and financing

- The candidate is expected to complete a joint PhD (double degree) at Tel Aviv University and KU Leuven. The doctoral degree is granted after writing a doctoral thesis, which is typically based on the student's scientific publications, and a public defense.
- The PhD studies take approximately 4 years. The candidate is expected to spend roughly half of the time in each of the universities. This requirement is flexible, but a minimum of one year must be spent at each university, placed within the relevant research groups. The beginning of the doctoral studies will take place at KU Leuven. Detailed arrangements will be negotiated with the selected candidate.
- The candidate is expected to receive a full-time salary/scholarship from the host universities for the entire duration of the PhD. At KU Leuven, an evaluation is performed within the first year of studies, which determines eligibility to continue in the PhD program.
- Tel-Aviv University offers international students housing, and Israel has a comprehensive health and social security system. Tel Aviv University's proximity to the artistic and commercial capital of Israel allows students to absorb the best of Israeli culture and society. English is spoken everywhere. For more information about living in Tel-Aviv: https://en-environment.tau.ac.il/International/City.
- At KU Leuven, the student will have access to a variety of social and recreational services, and Belgium has a comprehensive social security system. KU Leuven's central European position provides easy access to major cities with fast train connections to London, Paris, and Amsterdam. English is spoken everywhere. For more information about living in Leuven: https://www.kuleuven.be/english/life-at-ku-leuven.

To Apply

Interested applicants should submit their full CV/resume, a 1-page cover letter, and a list of three referees, compiled in a single PDF document, to Prof. Claudio Roncoli (claudio.roncoli@kuleuven.be) and Prof. Bat-hen Nahmias-Biran (bathennb@tauex.tau.ac.il) by **1 May 2025**. We regret that only shortlisted candidates will be notified.